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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

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MISLEADING, UNPROVEN REPORTS OF GRAPHIUM ULMI ON BURBANK PLUM

M. A. Clarke and R. K. Beattie
Division of Forest Pathology, Bureau of Plant Industry,
in Cooperation with Emergency Conservation Work

Since the beginning of the year four popular German articles 1/# have reported that in Italy a disease of the "Burbank" plum is caused by Graphium ulmi, the causal organism of the Dutch elm disease. The articles refer to work by a Dr. Franceschi.2/ Through the kindness of Dr. B. Peyronel of the Reale Istituto Superiore Agrario e Forestale at Firenze, Italy, a copy of Dr. Franceschi's article has been obtained.

#Footnotes at end of article.

Franceschi describes a dying of Burbank plums as follows: " . . . trovai che, mentre l'apparato radicale era perfetto, il midollo dei rami e del tronco aceva assunto un colore giallastro (simile alle macchie di nicotina) e presentava qua e lá segni evidenti di necrosi." In English this reads: " . . . I found that while the root system was perfect, the pith of the trunk and branches had assumed a yellowish hue (like a nicotine stain) and showed signs here and there of necrosis."

No isolations of an associated fungus and no inoculations are reported. Instead, the author says: "Intanto fervevano le ricerche per la scoperta dell' agente distruttore. Si pensó ad un fungo; se ne parlò; se ne discusse e si giunse alla conclusione che la moria del 'Burbank' era dovuta allo stesso agente, il 'Graphium ulmi' che attacca e distrugge i magnifici olmi della pianura romagnola." Literally translated, this reads: "In the meantime we sought the discovery of the destructive agent. It was thought about a fungus; it was talked about, it was discussed concerning it; and it was concluded that the disease of the Burbank plum was due to the same agent, Graphium ulmi, which attacks and kills the magnificent elms of the Romagna plain."

Other articles soon appeared questioning the conclusion that the disease is caused by the Dutch elm disease fungus. Dr. Gabriele Goidanich of the Reale Istituto Superiore Agrario at Bologna is quoted[3] as saying that the Burbank plum disease is not caused by Graphium ulmi, but that a superficial resemblance between the plum and the elm diseases has caused them to be confused. In an article published in the bulletin of the Reale Stazione di Patologia Vegetale[4] Dr. Goidanich gives the most recent results of research on this same disease of the Burbank and Santa Rosa plums in Italy. To quote from the English summary of the article: "The present decay is thought to be similar to the disease called 'Obstbaumsterben, Apoplexie, Schlagfluss' in central Europe, of which it would form a particular type (characterized by an alteration of the phloem followed by an alteration of the xylem) that the author proposes to call 'non parasitic leptonecrosis.'" Dr. Goidanich considers that the probable causes of the disease are "the effect of the cold, soil conditions and incompatibility between stock and scion." In this article no comment is made on the possible connection of Graphium ulmi with the disease.

So far there is no evidence that Graphium ulmi can live parasitically upon any plants except many species of Ulmus and an elm relative, Zelkowa serrata (keyaki). As reported at the 1934 Pittsburgh meeting of the A.A.A.S.,[5] the Graphium stage of Ceratostomella ulmi has been grown saprophytically on unsterilized wood of 22 species of American trees, including such common trees as the maple, beech, and oak, but there is no evidence of its parasitism on them. This fact, coupled with Dr. Goidanich's explanation of the plum disease, leads one to believe that the reports of the Dutch elm disease on the Burbank plum in Italy are without foundation. (June 17)

1/ R(einboth), G. Das Burbanksterben in Italien. Schweiz. Zeitschr. Obst- u. Weinbau 44:13-16. Jan. 12, 1935.

Goetz, O. Die Italienischen Burbank-Pflaumenanlagen durch Graphium ulmi zerstört. Obst- u. Gemüsebau 81:28-29. Feb. 1935.

Reinboth, G. Graphium ulmi und die Burbank-pflaumen. Zeitschr. Pflanzenkr. 45:143-146. March 1935.

R(einboth),G. Die Burbank-Katastrophe. Die Umschau 39:181-182. March 1935.

2/ Franceschi, L. L'invadenza parrassitaria una minaccia al susino Burbank. Il Giornale d'Italia Agricolo 17:5. Dec. 9, 1934.

3/ Richter, H. Absterben der Burbankpflaume in Italien wird nicht durch Graphium ulmi verursacht. Nachrichtenbl. Deutsch. Pflanzensch.Dienst 15:41. April 1935.

4/ Goidanich, G. Ricerche sul "deperimento" dei susino. Boll. R. Staz. Pat. Veg. N. S. 14: 339-381. (XII) 1934.

5/ Beattie, R. K. Research during 1934 on Ceratostomella ulmi, the cause of the Dutch Elm Disease. Jour. Econ. Entom. In press.

ANTHRACNOSE ON WHITE OAK

In the preceding issue of the Reporter (page 145), Carl Hartley of the Division of Forest Pathology reported that according to observations made from the train, anthracnose (Gnomonia veneta) was unusually prevalent on sycamore trees but was not evident on white oaks. In a later report he writes:

> "After seeing the heavy infection on white oak from Lansing to Battle Creek, Michigan, yesterday, I am less sure of my negative evidence. I find that even where infection is heaviest, many trees are entirely free, and that a 30 per cent infection may be so limited to the interior of the crown as to be scarcely visible from the outside. In notes made mostly from the train I could easily have missed some moderate local infection." (June 21).

LEAF VARIEGATION OF THE BLAKEMORE STRAWBERRY

V. H. Young wrote from Arkansas on April 17:

> "Since the fall of 1933, when we first called attention to the so-called 'suspected mosaic' of Blakemore strawberries in Arkansas, it has been noted repeatedly on the Blakemore in this State, and once on an unimportant western variety, and this season it is appearing in much increased amounts. Mr. Paul H. Millar, Chief Inspector of the Arkansas State Plant Board, wrote me that he had found a field of Blakemores near Kensett, in which 75 per cent of the plants showed this trouble. Recently he condemned some carlot shipments of Blakemore plants sent from Tennessee into this State because of 'suspected mosaic.'
>
> "We are becoming much concerned over the increase of this trouble in the State, and are worried lest we have to begin advising against the use of the Blakemore variety which has proved very desirable from many points of view and is widely planted in the State.
>
> "It seems to me that it would be desirable to have information regarding this situation from all over the country in order that we may better contend with it."

In a recent report from Tennessee, Paul R. Miller of this Division writes:

> "Yellows was found generally on Blakemore strawberries in all western Tennessee fields where this variety was grown. Twelve fields totalling 150 acres showed an average of 8 per cent diseased plants.

Since the first notice in the Reporter of variegation in the Blakemore strawberry (P. D. R. 18:145-147) it has been reported from eight States as follows: Massachusetts, Maryland, Virginia, Tennessee, North Carolina, Louisiana, Oklahoma, and Arkansas. As pointed out in the article just mentioned and by Dr. Darrow (P. D. R. 18:26-29) "variegation," "suspected mosaic," or"June yellows," as it has been variously called, is neither a new strawberry malady, nor is it confined to the Blakemore variety. Off-sets from affected plants develop the abnormality but no successful attempts to transmit the character to normal plants by inoculation or budding have been reported and opinion appears to vary as to whether the condition is of infectious or genetic origin. Reports indicate that it is becoming more prevalent but proof of spread except by propagation of affected plants is not established.

Observations on the behaviour of the Blakemore with respect to this character, wherever the variety has been tried are of interest. Reports of fields remaining free from the trouble as well as records of the appearance and spread of the variegation in localities from which it has not previously been recorded are solicited.

SOME REPORTS ON FRUIT DISEASES

BLACK ROOT ROT OF APPLE IN INDIANA: I am sending parts of affected apple roots taken from a Delicious tree and also a single Xylaria fruiting structure found on the roots. The tree was situated in the Purdue Experimental orchard at Mitchell. This is evidently black root rot (Xylaria mali) which apparently has not been reported from Indiana for several years. (R. C. Baines, June 19)

APPLE SCAB IN INDIANA: Secondary infection of apple scab (Venturia inaequalis) is becoming serious in many orchards, necessitating applications of fungicides. (R. C. Baines, June 19).

BACTERIAL SPOT OF PEACH: Paul R. Miller reports that Bacterium pruni has caused considerable defoliation in orchards in western Tennessee this season. R. C. Baines writes (June 19) "A serious outbreak of Bacterium pruni has occurred in two peach orchards of 40 and 30 acres at Mitchell, Indiana. At this time 90 per cent of the crop is infected and will be unmarketable. The leaves are also heavily infected, but, due probably to the cool rainy weather, leaf fall has not been very pronounced."

CROWN GALL ON RASPBERRY IN KENTUCKY: Raspberry plants affected with crown gall were received from Graves County. According to the county agent, T. C. Routt, 50% of a one-acre planting, set three years ago, have died from this disease.

VEGETABLE DISEASE NOTES FROM NEW YORK

A. G. Newhall

LETTUCE: Mosaic has been found unusually high in a certain seed lot sold to a few growers in the Eden Valley truck crop section near Buffalo. Counts in different fields of Big Boston ran from 8 to 16 per cent while in adjacent fields of the same and other varieties from different sources not over 2 or 3 per cent could be found May 30, 1935.

Botrytis stem rot continues to claim from 10 to 15 per cent of the spring crop of Big Boston head lettuce in the Eden Valley district in fields where lettuce is grown year after year. Most of the plants appeared to become infected at the time they were transplanted to the field. The cool weather seemed to retard secondary spread.

Sclerotinia has been conspicuously lacking in these fields where it was severe a few years ago.

CELERY: A severe case of Phoma root rot developed on a field of early celery near Port Byron, New York, in May and June. The seedlings became infected in the seedbed or cold frames and although many were discarded at transplanting time a high percentage of the plants which were set developed a sickly stunted appearance. On removal from the muck these were found June 10 to have a brown, reduced root system with numerous pycnidia studding the crown lesions. (June 18)

DISEASES OF POTATOES AND TOMATOES

WESTERN TENNESSEE: In Morgan County mosaic was found on 90 per cent of the potato plants in one six-acre field and on 15 per cent in a five-acre field. Other than this and a few scattered plants with tipburn and hopperburn, the 150 acres of potatoes observed were apparently free from disease.

Fifty per cent of the tomato plants in a two-acre field were found to have mosaic. Generally the tomatoes of western Tennessee were exceptionally free from diseases. (Paul R. Miller, June 17)

ILLINOIS: Potatoes affected by brown rot (Bacterium solanacearum) were sent in by the county adviser from Morgan County with the notation that it was causing severe losses. Cultures were made to aid in diagnosis. (June 18, 1935)

A great many tomato plants are showing early infections of Septoria lycopersici upon the lower leaves. Since the infections are occurring so early spraying or dusting with Bordeaux mixture has been recommended. (K. J. Kadow, June 21, 1935)

STEM RUST OF CEREALS

E. C. Stakman
Agent, Plant Disease Control

(Note: The following summary of cereal rust conditions is published through the courtesy of the Bureau of Entomology and Plant Quarantine).

Through central Texas there was considerable development of rust. About 5 per cent of the fields were severely damaged, while there was considerable damage in a large percentage of the others. In this area stem rust (Puccinia graminis) caused about 20 per cent loss. Northward through central Oklahoma there was less than 1 per cent of stem rust

on hard wheat, but somewhat more on soft wheat. It seems unlikely that there will be really appreciable damage except to occasional fields, especially of soft wheat. In the southern half of Missouri and Kansas wheat is now mostly in the hard dough stage or beyond and there is a moderate amount of stem rust, the average about a week ago being a few pustules on approximately 50 per cent of the plants. It appeared, however, that extensive damage was not likely. This can not, however, be stated with finality because on soft wheat particularly there may be considerable development of rust if the weather should become warm and muggy.

In western Illinois, northern Missouri, Nebraska, and western Iowa there is trace to trace plus of stem rust in most fields of wheat. In much of the area the stands are extremely heavy and there is a possibility that rust would develop very rapidly under favorable weather conditions. Since the wheat is for the most part in the dough, there still is time for considerable rust to develop, and it would be unsafe to attempt to predict how much there might eventually be. A great deal depends on weather conditions.

In southwestern Ohio recently there was a trace of rust in 10 out of 115 fields examined, and the wheat was in the flower to the milk stage. In Indiana the wheat ranged from hard dough in the south to soft dough in the general latitude of Indianapolis and milk in the latitude of Lafayette. While no stem rust had been found, it undoubtedly is present.

Rust also has made its appearance in the spring wheat area. It has been found as far north as Madison, South Dakota, and Waseca, Minnesota. The amount, however, is small. The stands in the spring wheat area are generally good, in some cases being very heavy. In a considerable portion of the area the wheat is a few days later than normal, although it appears to be catching up fast. To attempt to make a prediction of the possible damage in the spring wheat area would of course be dangerous at the present time. While the rust appears to be slightly later than normal, the grains also are somewhat later. If the present cool and clear weather continues, conditions will of course be unfavorable for the rapid development of the rust. If, on the other hand, it should be hot and muggy, even for a week, there might be rather rapid development.

Rust has been spreading from barberries in a number of areas in the eradication territory, but so far destructive epidemics have not appeared.

There is very little stem rust on oats anywhere from Texas northward, and this rust has not appeared so far north as the infection on wheat.

Leaf rust of wheat (Puccinia rubigo-vera tritici) is prevalent throughout. (June 22)

GLOEOSPORIUM ON RHODOTYPOS

Decorative plantings of Rhodotypos kerrioides are being attacked in northern Illinois by a Gloeosporium indistinguishable morphologically from the Gloeosporium so prevalent this spring on sycamore and white oak. The disease produced is a typical anthracnose. Leaf blades are not attacked, but the young shoots of this season are attacked at their bases. Frequently, also, infection occurs near the tips of the new shoots, producing a shepherd's crook. Lesions at first are brown but rapidly bleach to an ashy white, when acervuli become very abundant. Infection spreads rapidly around the stem and extends lengthwise from one-half to two inches. Parts distal to lesions wilt and die, but new shoots rapidly extend from collateral buds to replace those that are killed.

For the most part, this anthracnose makes its initial appearance in the lower parts of shrubs, where moisture may especially favor it, and spreads upward. (L. R. Tehon, June 27)

A REMINDER

The small grains season has already closed in Southern sections, harvest is in progress in intermediate regions and cereals in the North are rapidly filling and approaching maturity. Cherries and early peaches have appeared in the market and later orchards crops are making the normal mid-summer progress. These sentences are just a reminder that the readers of the Reporter would like your comments on disease conditions while they are current. After-harvest summaries and reports on diseases while the crops are still making are of continued interest and value. They form the basis of conversation among pathologists wherever they meet and we would like to have many more of them to publish. Do not neglect to send in your contributions. The more individual reports, the more complete and valuable the information. (H. A. Edson)